REMARKS

Claims 68-94 are currently pending in the above-identified application.

Rejections under 35 U.S.C. §103

Claims 68-90 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wu et al. (U.S. Patent No. 5,338,198, hereinafter referred to as "Wu") in view of Yoon et al. (U.S. Patent No. 5,742,700, hereinafter referred to as "Yoon"). Applicants respectfully traverse.

Applicants are unclear as to the basis of the rejection because the present rejection appears to contradict the Examiner's previous position regarding the teachings of Wu and Yoon. In particular, Applicants point out that the Examiner has previously admitted that the combination of Wu and Yoon "does not show using interproximal or gingival regions as the negative regions used to find a component" (See, e.g., Office communication mailed 6/14/05, page 4). In the present Office action, however, it is now alleged that Yoon shows using the interproximal region, at Figure 4, in computer calculations for determining information about the tooth.

Moreover, the Examiner has failed to establish that Yoon, in fact, teaches identification of an interproximal region between two teeth, as recited in claim 68. While the Examiner has generally referenced Figure 4 of Yoon in response to Applicants previous remarks (Office Action mailed 12/27/2005, page 3), Applicants are unable to identify in the Figure 4, or anywhere else in the reference, where Yoon teaches identifying and labeling elements that represent an interproximal margin between two teeth in the dentition.

As Applicants have previously made of record, Yoon teaches generically identifying, from a 2-dimensional X-ray image, the outer boundaries of tooth enamel and dentinoenamel junction in for the purposes of detecting dental carries (see Yoon, Fig. 4, col. 4, lines 12-14; col. 5, lines 45-57), but Yoon does not teach specifically identifying and labeling an interproximal margin between teeth. In particular, nowhere does Yoon teach a technique that identifies elements that represent an interproximal margin between two teeth in the dentition, labels those data elements as belonging to the interproximal margin, and selects data elements

that lie on one side of the interproximal margin for inclusion in the digital model of the tooth, as recited in claim 68. Additionally, Applicants respectfully point out that, while included in the rejection, the patentability of dependent claims 69-90 has not been specifically addressed by the Examiner, and Applicants submit that these claims further distinguish from the cited references.

Accordingly, for the reasons set forth above, Applicants respectfully request withdrawal of the rejection of claims 68-90 under 35 U.S.C. §103(a).

Claims 91-94 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wu in view of Yoon and Andreiko et al. (U.S. Patent No. 5,395,238, hereinafter referred to as "Andreiko"). Applicants respectfully traverse these rejections.

Applicants respectfully disagree that it would have been prima facie obvious to combine Wu, Yoon, and Andreiko as suggested by the Examiner, or that any reasonable combination of the references would produce the claimed invention. See, e.g., MPEP §§ 2141-2143.

Specifically, the Examiner has failed to identify any suggestion or motivation, either in the Wu, Yoon, or Andreiko references, or in the knowledge generally available to those of ordinary skill, to modify the references so as to produce the claimed invention. Wu describes techniques for preparing a 3-D model of a patient's teeth by taking molded impressions of the mandibular and maxillar teeth, placing separately the impressions on a support table, define an X-Y plane and detecting the Z distance from a probe by directing a beam of laser light onto the impression and calculating from the pattern of reflected light a centre of the light falling on an area array.

In contrast to Wu, Yoon does not even deal with a 3-D imaging, but instead teaches a gradient method of analysis of 2-dimensional X-ray images in order to detect the boundaries of tooth enamel and dentin tissues for the purposes of detecting dental carries. Each of these two very different systems of Wu and Yoon includes components tailored for its intended purpose, and there is no teaching or suggestion that would motivate one of ordinary skill in the art to seek to modify/combine the 2-dimensional gradient method of Yoon for use in a 3-D model of Wu, and there are certainly no teachings in the cited references as to how such a

modification would even be accomplished. Thus, there is no suggestion or motivation to combine Wu and Yoon, as suggested by the Examiner.

Moreover, while Andreiko teaches determining tooth parameters including tooth-gum intersection parameters, the determination taught by Andreiko is substantially different than and opposite from the method of claim 91. In Andreiko, parameters are first physically determined from a conventional model of the patient's mouth (i.e., not a 3D dataset), and subsequently converted into digital data (see, e.g., Andreiko, col 5, lines 1-14 and 38-41). In contrast to Andreiko, in the method of claim 91 data elements representing a gingival boundary are first determined from the 3D data set representing the dentition and a digital model for a tooth is then determined based upon the gingival boundary data elements. As such, there would be no suggestion or motivation, in the cited references or elsewhere, to modify Wu and Yoon according to the teachings of Andreiko, and no reasonable combination of the cited references would teach or suggest the claimed invention.

With respect to step (c) of claim 91, it is alleged at page 4 of the Office action that "Andreiko teaches using the gum intersection boundary in computer calculations". First, Applicants are unclear as to the interpretation of the term "computer calculations" as the term does not appear in either the cited reference or the currently pending claims, and the Examiner has not cited to any particular provision of Andreiko in dismissing Applicants previous remarks. Regardless of the interpretation of the term, however, Applicants submit that while Andreiko appears to teach use of tooth-gum contour data in determining disposition of a bracket or depth and angle of a slot or groove in the bracket, Andreiko fails to teach identifying other data elements representing portions of the tooth by testing the data elements lying on the gingival boundary. In particular, Andreiko does not teach "applying a test to the data elements lying on the gingival boundary to identify other data elements representing portions of the tooth", as specifically recited in claim 91.

Applicants respectfully point out that the Examiner bears the initial burden of factually establishing and supporting any assertion of prima facie obviousness, including motivation to make the combination of references cited by the Examiner. MPEP § 2142. In the present case, the Examiner has not pointed to any evidence in Wu, Yoon or Andreiko, or

knowledge of those skilled in the art, that would provide a suggestion or motivation to modify the reference teachings of Wu with the teachings of Yoon and Andreiko as to produce the claimed invention defined by claim 91. Additionally, Applicants respectfully point out that, while dependent claims 92-94 have been included in the rejection, the patentability of these claims has not been specifically addressed by the Examiner, and Applicants submit that dependent claims 92-94 further distinguish from the cited references.

Therefore, it is respectfully submitted that the rejection under 35 U.S.C. §103(a) should be removed for the reasons set forth above or, if the rejection is not removed, that the Examiner provide some objective indicia, separate from the Applicants' own disclosure (e.g., hindsight reconstruction), to support the Examiner's position that one of ordinary skill would have had any motivation to combine the teachings of Wu, Yoon, and Andreiko, and that such a combination would produce the claimed invention.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 206-467-9600.

Respectfully submitted,

Date: 3/27/06 By: _____

Michael T. Rosato
Reg. No. 52,182

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 206-467-9600
Fax: 415-576-0300
MTR:jms
60682852 v1